
**Animal and vegetable fats and
oils — Determination of aliphatic
hydrocarbons in vegetable oils**

*Corp gras d'origines animale et végétale — Détermination des
hydrocarbures aliphatiques en corps gras d'origines végétale*



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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

The committee responsible for this document is ISO/TC 34, *Food products*, Subcommittee SC 11, *Animal and vegetable fats and oils*.

Introduction

The major saturated hydrocarbons present in vegetable oils are long chain *n*-alkanes, containing more than 21 carbon atoms, and having an odd carbon number preference.^[1]

Mineral oils can contain *n*-alkanes with up to 60 carbon atoms with no odd carbon predominance. Chromatograms of mineral oils obtained by this method are characterized by a wide peak due to the presence of a complex mixture of saturated branched and cyclic hydrocarbons. Medium and low viscosity mineral oils are typically characterized by a complex mixture with between C10 and C25 chain length; while high viscosity mineral oils are indicated by a complex mixture with the midpoint around C30 chain length.^[2] The Joint FAO/WHO Expert Committee on Food Additives (JECFA) has set several ADIs for mineral oil (2002) dividing low-medium viscosity mineral oils into three different subclasses depending on the point of toxicity. This method does not help to distinguish between different classes.

Chromatograms of diesel oil are characterized by the presence of *n*-alkanes between C10 and C25 chain length with no odd carbon predominance, i.e. both even and odd numbered hydrocarbons are present in relatively equal proportions.

Animal and vegetable fats and oils — Determination of aliphatic hydrocarbons in vegetable oils

1 Scope

This International Standard specifies a method for the determination of saturated aliphatic hydrocarbons from C10 to C56 of natural origin present in vegetable oils, and for detecting the presence of mineral oil and diesel oil.

The method is applicable to all types of crude and refined edible oils and fats, for concentrations of mineral oils from 50 mg/kg to 1 000 mg/kg.

A rapid method for refined and virgin (or cold-pressed) oils is proposed in [Annex C](#). This rapid method is not adapted for crude oils due to a lack of retention of triglycerides observed for some samples.

A method for fat recovery from food samples by soxhlet extraction with a blend of solvents is proposed in [Annex D](#).

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 661, *Animal and vegetable fats and oils — Preparation of test sample*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

hydrocarbon contents

sum of saturated aliphatic hydrocarbons, expressed as a mass fraction, determined according to the method specified

3.2

unresolved complex mixture

UCM

complex mixture of saturated hydrocarbons not resolved by gas chromatography, represented by a wide peak, which can be due to a contamination with mineral oil

Note 1 to entry: The width of the peak is approximately 5 min to 15 min depending on gas chromatography conditions,

Note 2 to entry: See relevant chromatograms in [Annex A](#).

3.3

diesel

sum of saturated *n*-alkanes between C10 and C25 chain length, expressed as a mass fraction, determined according to the method

Note 1 to entry: See relevant chromatograms in [Annex A](#).